

BARRIER FIRST METHOD FOR SINGLE DAMASCENE TRENCH APPLICATIONS

ABSTRACT OF THE DISCLOSURE

5 Methods for forming a diffusion barrier on low aspect features of an integrated
circuit include at least three operations. The first operation deposits a barrier material and
simultaneously etches a portion of an underlying metal at the bottoms of recessed features
of the integrated circuit. The second operation deposits barrier material to provide some
minimal coverage over the bottoms of the recessed features. The third operation deposits a
10 metal conductive layer. Controlled etching is used to selectively remove barrier material
from the bottom of the recessed features, either completely or partially, thus reducing the
resistance of subsequently formed metal interconnects.